

REMARKS

This is a full and timely response to the outstanding final Office Action mailed September 13, 2005. Claims 1-7, 9-11, 13-19, and 21-28 remain pending in the present application. Reconsideration and allowance of the application and pending claims are respectfully requested.

1. **Response To Rejections of Claims Under 35 U.S.C. §103**

In the Office Action, claims 1-7 and 9-11 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Hawkins '202* (U.S. Patent No. 5,006,202) in view of *Milligan* (U.S. Patent No. 6,273,557). Claims 13-19 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Hawkins '042* (U.S. Patent No. 6,303,042) in view of *Milligan*. Claims 21-22 and 27-28 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Milligan*. Claims 21-26 and 29 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Miller* (U.S. Patent Application Publication No. 2003/0141279 A1). It is well-established at law that, for a proper rejection of a claim under 35 U.S.C. §103 as being obvious based upon a combination of references, the cited combination of references must disclose, teach, or suggest, either implicitly or explicitly, all elements/features/steps of the claim at issue. See, e.g., *In Re Dow Chemical*, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988), and *In re Keller*, 208 U.S.P.Q.2d 871, 881 (C.C.P.A. 1981).

a. **Claim 1**

As provided in independent claim 1, Applicants claim:

A print head die forming method comprising:
forming a plurality of fluid-handling passageways and ejection chambers over a first surface of a substrate;
subsequent to said forming a plurality of fluid-handling passageways and ejection chambers, forming a first patterned masking layer sufficient to expose a desired area of a second generally opposing surface of the substrate;
after forming the first patterned masking layer, forming a second patterned masking layer sufficient to expose less than the entirety of the desired area of the first surface;
forming a slot portion in the substrate through the second patterned masking layer; and
removing additional substrate material to form a fluid-handling slot sufficient to supply fluid from the second surface through the substrate to the first surface and the fluid handling passageways.

(Emphasis added).

Applicants respectfully submit that independent claim 1 is allowable for at least the reason that *Hawkins '202* in view of *Milligan* does not disclose, teach, or suggest at least "after forming the first patterned masking layer, forming a second patterned masking layer sufficient to expose less than the entirety of the desired area of the first surface," as recited and emphasized above.

Rather, *Hawkins '202* appears to disclose at most a structure having a first masking layer 34 exposing an area of a surface of a substrate 12, as shown in FIG. 3. Later, in FIG. 4 a second masking layer 14 is added. However, the second masking layer does not expose less than the entirety of the area of the surface of substrate 12 mentioned previously. Moreover, FIG. 5 also shows a photo resist layer 30 being added that does not expose less than the entirety of the area of the surface mentioned previously.

With regard to *Milligan*, FIGs. 5A-5B appear to show a structure with a masking layer 403 and an exposed area matching the entirety of the exposed surface of the structure. It is noted that a photoresist layer 504 is added after the slot portion 501 has been formed using the masking layer 403, as shown in FIG. 5C.

Therefore, *Hawkins '202* and *Milligan* each fail to teach or suggest "after forming the first patterned masking layer, forming a second patterned masking layer sufficient to expose less than the entirety of the desired area of the first surface." For at least this reason, a *prima facie* case establishing an obviousness rejection by the proposed combination of *Hawkins '202* in view of *Milligan* has not been made. Therefore, the rejection of claim 1 should be withdrawn.

b. Claims 2-7

Because independent claim 1 is allowable over the cited art of record, dependent claims 2-7 (which depend from independent claim 1) are allowable as a matter of law for at least the reason that the dependent claims 2-7 contain all the steps and features of independent claim 1. For at least this reason, the rejection of claims 2-7 should be withdrawn.

Additionally and notwithstanding the foregoing reasons for allowability of claims 2-7, these claims recite further features and/or combinations of features (as is apparent by examination of the claims themselves) that are patentably distinct from the cited art of record. Hence, there are other reasons why these dependent claims are allowable. For example, the feature wherein the "act of forming a second patterned masking layer comprises forming a

photo-resist layer," as recited in claim 3, is not taught or suggested by the proposed combination.

Accordingly, the rejections to these claims should be withdrawn.

c. Claim 9

As provided in independent claim 9, Applicants claim:

A fluid-feed slot forming method comprising:
forming a plurality of fluid-handling passageways and ejection chambers over a first substrate surface;

subsequent to said forming a plurality of fluid-handling passageways and ejection chambers over a first substrate surface, patterning a hard mask on a generally opposing second substrate sufficient to expose a first area of the first surface;

forming a slot portion in the substrate through less than an entirety of the first area of the first surface, the slot portion having a cross-sectional area at the first surface that is less than a cross-sectional area of the first area; and

after forming the slot portion, etching the substrate to remove material from within the first area to form a fluid-handling slot between the first and second surfaces sufficient to supply fluid to the fluid handling passageways.

(Emphasis added).

Applicants respectfully submit that independent claim 9 is allowable for at least the reason that *Hawkins '202* in view of *Milligan* does not disclose, teach, or suggest at least "forming a slot portion in the substrate through less than an entirety of the first area of the first surface, the slot portion having a cross-sectional area at the first surface that is less than a cross-sectional area of the first area," as recited and emphasized above.

Rather, *Hawkins '202* appears to disclose at most a structure having a first masking layer 34 exposing an area of a surface of a substrate 12, as shown in FIG. 3. Later, in FIG. 4 a second masking layer 14 is added. However, the second masking layer does not expose less than the entirety of the area of the surface of substrate 12 mentioned previously. Moreover, FIG. 5 also shows a photo resist layer 30 being added that does not expose less than the entirety of the area of the surface mentioned previously.

With regard to *Milligan*, FIGs. 5A-5B appear to show a structure with a masking layer 403 and an exposed area matching the entirety of the exposed surface of the structure. It is noted that a photoresist layer 504 is added after the slot portion 501 has been formed using the masking layer 403, as shown in FIG. 5C.

Therefore, *Hawkins '202* and *Milligan* each fail to teach or suggest "forming a slot portion in the substrate through less than an entirety of the first area of the first surface, the slot portion having a cross-sectional area at the first surface that is less than a cross-sectional area of the first area." For at least this reason, a *prima facie* case establishing an obviousness rejection by the proposed combination of *Hawkins '202* in view of *Milligan* has not been made. Therefore, the rejection of claim 9 should be withdrawn.

d. Claims 10-11

Because independent claim 9 is allowable over the cited art of record, dependent claims 10-11 (which depend from independent claim 9) are allowable as a matter of law for at least the reason that the dependent claims 10-11 contain all the steps and features of independent claim 9. For at least this reason, the rejection of claims 10-11 should be withdrawn.

Additionally and notwithstanding the foregoing reasons for allowability of claims 10-11, these claims recite further features and/or combinations of features (as is apparent by examination of the claims themselves) that are patentably distinct from the cited art of record. Hence, there are other reasons why these dependent claims are allowable.

Accordingly, the rejections to these claims should be withdrawn.

e. Claim 13

As provided in independent claim 13, Applicants claim:

A print head substrate forming method comprising:
forming a plurality of fluid-handling passageways and ejection chambers over a first substrate surface;
subsequent to said forming a plurality of fluid-handling passageways and ejection chambers, exposing a first portion of a second generally opposing substrate surface through a hard mask;
forming a photoresist over the hard mask and the first portion;
removing at least some of the photoresist to expose a second portion of the substrate surface through which a slot portion is to be formed;
dry etching the substrate through the photoresist sufficient to form the slot portion, and,
after said dry etching, wet etching the substrate to form a fluid-handling slot through the substrate to supply fluid received at the second surface through the substrate and to the fluid-handling passageways and ejection chambers.

(Emphasis added).

Applicants respectfully submit that independent claim 13 is allowable for at least the reason that *Hawkins '042* in view of *Milligan* does not disclose, teach, or suggest at least "after said dry etching, wet etching the substrate to form a fluid-handling slot through the substrate to supply fluid received at the second surface through the substrate and to the fluid-handling passageways and ejection chambers," as recited and emphasized above.

Rather, *Hawkins '042* appears to disclose at most a structure having an etched region 534 that does not extend from a second surface of the substrate to a first surface of the substrate, as described in claim 13. Therefore, *Hawkins '042* in view of *Milligan* does not disclose, teach, or suggest all of the features of claim 13, since *Milligan* does not remedy the deficiencies of the *Hawkins '042* reference. For at least this reason, a *prima facie* case establishing an obviousness rejection by the proposed combination of *Hawkins '042* in view of *Milligan* has not been made. Therefore, the rejection of claim 13 should be withdrawn.

f. Claims 14-19

Because independent claim 13 is allowable over the cited art of record, dependent claims 14-19 (which depend from independent claim 13) are allowable as a matter of law for at least the reason that the dependent claims 14-19 contain all the elements and features of independent claim 13. For at least this reason, the rejection of claims 14-19 should be withdrawn.

Additionally and notwithstanding the foregoing reasons for allowability of claims 14-19, these claims recite further features and/or combinations of features (as is apparent by examination of the claims themselves) that are patentably distinct from the cited art of record. Hence, there are other reasons why these dependent claims are allowable.

Accordingly, the rejections to these claims should be withdrawn.

g. Claim 21

As provided in independent claim 21, Applicants claim:

A print head forming method comprising:
forming a fluid-handling slot extending between a thin-film surface of a substrate and a generally opposing backside surface of the substrate; the slot extending along a long axis that lies generally parallel to the thin-film surface, wherein the slot has a cross-section taken transverse the long axis that is defined, at least in part, by one sidewall, wherein at least a first portion of the one sidewall is generally parallel to

the thin-film surface of the substrate, and wherein a second portion of the one sidewall is generally perpendicular to the thin-film surface, and *wherein a third portion of the sidewall extends from the second portion to the thin-film surface of the substrate and defines an obtuse angle with the second portion as measured through the slot.*

(Emphasis added).

Applicants respectfully submit that independent claim 21 is allowable for at least the reason that *Milligan* does not disclose, teach, or suggest at least "wherein a third portion of the sidewall extends from the second portion to the thin-film surface of the substrate and defines an obtuse angle with the second portion as measured through the slot," as recited and emphasized above.

Rather, *Milligan* appears to disclose at most a structure having a vertical sidewall 601 extending from a second portion of the sidewall to the thin-film surface 406, as shown in FIG. 7B. Therefore, *Milligan* fails to teach or suggest "wherein a third portion of the sidewall extends from the second portion to the thin-film surface of the substrate and defines an obtuse angle with the second portion as measured through the slot." For at least this reason, a *prima facie* case establishing an obviousness rejection by *Milligan* has not been made. Therefore, the rejection of claim 21 should be withdrawn.

Additionally, Applicants respectfully traverse the finding in the Office Action of Official Notice with regard to claim 27. Per MPEP 2144.03(A), "It would not be appropriate for the examiner to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known." Also, per MPEP 2144.03(B), "If such notice is taken, the basis for such reasoning must be set forth explicitly. The Examiner must provide specific factual findings predicated on sound technical and scientific reasoning to support his or her conclusion of common knowledge."

As specific factual findings predicated on sound technical and scientific reasoning in support of the conclusion of common knowledge are not provided in the Office Action, the Official Notice and the rejections based upon this finding should be withdrawn. If this rejection is maintained, Applicants respectfully request that a document be provided as support.

h. Claims 22 and 27-28

Because independent claim 21 is allowable over the cited art of record, dependent

claims 22 and 27-28 (which depend from independent claim 21) are allowable as a matter of law for at least the reason that the dependent claims 22 and 27-28 contain all the steps and features of independent claim 21. For at least this reason, the rejection of claims 22 and 27-28 should be withdrawn.

Additionally and notwithstanding the foregoing reasons for allowability of claims 22 and 27-28, these claims recite further features and/or combinations of features (as is apparent by examination of the claims themselves) that are patentably distinct from the cited art of record. Hence, there are other reasons why these dependent claims are allowable.

Accordingly, the rejections to these claims should be withdrawn.

i. Claims 21-26 and 29

Applicants respectfully submit that independent claim 21 is allowable for at least the reason that *Miller* does not disclose, teach, or suggest at least "wherein a third portion of the sidewall extends from the second portion to the thin-film surface of the substrate and defines an obtuse angle with the second portion as measured through the slot," as recited and emphasized above.

Rather, *Miller* appears to disclose at most a structure having a vertical sidewall extending from one portion of the sidewall to the thin-film surface 610, as shown in Fig. 9b. Therefore, *Miller* fails to teach or suggest "wherein a third portion of the sidewall extends from the second portion to the thin-film surface of the substrate and defines an obtuse angle with the second portion as measured through the slot." For at least this reason, a *prima facie* case establishing an obviousness rejection by *Miller* has not been made. Therefore, the rejection of claim 21 and claims 22-26 & 29 (which depend from claim 21) should be withdrawn.

CONCLUSION

For at least the reasons set forth above, Applicants respectfully submit that all objections and/or rejections have been traversed, rendered moot, and/or accommodated, and that the pending claims are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned agent at (770) 933-9500.

Respectfully submitted,


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